The LAIRAH Project:
Log Analysis of Digital Resources in the Arts and Humanities
Final Report to the
Arts and Humanities Research Council

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2. Executive Summary

2.1 Introduction

Digital Humanities is a relatively young but very productive discipline. In its short history scholars have produced thousands of digital resources which have been funded by governments, philanthropic bodies and universities. In the UK alone, over 250 digital humanities projects have been funded by the Arts and Humanities Research Council (AHRC) since 1998. Yet what happens to such resources after completion is poorly understood. Anecdotal evidence suggests that some projects become well known but others have been relatively quickly forgotten. This is regrettable since the non-use of a resource represents a waste both of the considerable intellectual effort and time expended in its production, and potentially considerable amounts of funding. No systematic survey of digital resource usage in the humanities has been undertaken, and the characteristics of a project that might predispose it for sustained use have never been studied.

This report presents the results the LAIRAH (Log analysis of Internet Resources in the Arts and Humanities) project (http://www.ucl.ac.uk/slais/research/circah/lairah/) based at UCL's School of Library Archive and Information Studies: a study to discover what influences the long-term sustainability and use of digital resources in the humanities.

2.2 Research objectives

- To determine the scale of the use of digital resources in the humanities, using deep log analysis of the Humbul, Artifact and AHDS portal sites.
- To determine whether resources that are used share any common characteristics.
- To highlight areas of good practice, and aspects of project design that might be improved to aid greater use and sustainability.

2.3 Key findings

Use Levels:
Levels of resource use were difficult to evaluate due to changes in service provision during the research period. However, our findings suggest that 30-35% of digital resources remain unused. This is comparable to the number of scientific articles that remain un-cited.

Names and subject matter:
Resources concerning popular subjects were especially well used. These included warfare, witchcraft, and census data. Resources used extensively by a small community are, however, equally valuable. The title of the resource effects whether it is used or neglected, and should therefore be as unambiguous as possible, for example "Census Data" rather than "Enumerator Returns".

Information Resources:
Information resources are vital for humanities scholars. Generic resources and collections of reference information such as the *e-DNB* or *The National Archives* website were more popular than specific research resources. Digital resources have not replaced physical information resources such as libraries, archives and research centres: a scholar's university library web site was the most valued digital resource in our questionnaire.

Critical awareness:
Users require high quality resources, both in terms of interface and content. If in any doubt about a resource's quality or authority they tend to abandon it.

Barriers to access:
Barriers to access deter many users. These may include having to download data, copyright permissions forms or an interface that is not easy to use. Only if it is essential to their work will users persist in using a resource with such features.

Signposting:
Non-expert users found it difficult to understand the purpose of several resources. As well as an unambiguous project title, they required information about the contents, scope and how it was selected; the purpose of the resource; and advice about how it might be used.

Documentation
Few projects kept formal documentation or made it easily available. The exceptions were projects in linguistics, archaeology and archives, areas in which the scholarly community regards documentation as an integral part of research.

User contact
Few projects carried out formal user testing, thus have little idea of the needs of their user community. Those projects which had carried out user tests were amongst the most well-used in our survey.

Dissemination:
Successful projects had worked hard to disseminate information about their resource. Individual scholars served as important exemplars of good practice: respect for their scholarship in digital humanities inspired others to undertake similar research.

Staffing:
Staff who are knowledgeable both about humanities research and ICT techniques were key to successful projects. However, a lack of appropriate training meant that they were difficult to find, and scarce funding made them difficult to retain from one project to another.

Sustainability:

Few projects realised the importance of ensuring their resource remained sustainable and that both content and interfaces must be maintained and updated. They did not appear to realise that archiving a resource with the AHDS does not guarantee its future accessibility. However, funding for maintenance is difficult to obtain.

2.4 Recommendations

2.4.1 The ideal well-used resource would

Content:
* Have an unambiguous name that indicates its purpose or content.

* Concern a subject that is either popular in a wide community or essential for a smaller expert one.

* Retain its server logs, and make them available to their funding agency and researchers, subject to confidentiality agreements.

* Keep documentation and make it available from the project web site, making clear the extent, provenance and selection methods of materials for the resource.

Users:
* Have a clear idea of whom the expected users might be; consult them as soon as possible and maintain contact through the project via a dedicated email list or website feedback.

* Carry out formal user surveys and software and interface tests and integrate the results into project design.

* Be designed for a wide variety of users, and include information to help the non-expert to understand the resource and use its contents.

Management:
* Have access to good technical support, ideally from a centre of excellence in digital humanities.

* Recruit staff who have both subject expertise and knowledge of digital humanities techniques, then train them in other specialist techniques as necessary.

* Have access to short term funds to allow it to retain expert staff between projects.

Dissemination:
* Have an attractive, usable interface, from which all material for the project may be accessed without the need to download further data or software.

* Maintain and actively update the interface, content and functionality of the resource, and not simply archive it with the AHDS.

* Disseminate information about itself widely, both within its own subject domain and in digital humanities.

2.4.2 Recommendations for funding bodies

Duties of projects:

* Log data should be made available to funding bodies and publicly funded research projects, subject to a written agreement with the research centre or project. If necessary there should be the provision for a confidentiality clause, specifying that individuals may not be identified in published research output.

* Projects should seek involvement with the AHDS subject centre throughout the development of the resource, and not simply at the time of grant writing or deposit.

* Applicants to the AHRC should show that they have consulted documentation of other relevant projects and to discuss what they have learnt from it in their case for support.

* Information should be disseminated widely about the reasons for user testing and its benefits, perhaps via AHRC/AHDS workshops. Projects should be encouraged to collaborate with experts on user behaviour.

2.4.3 Funding procedures

Log data:
*The AHRC might require funded projects and research centres to maintain log data for an agreed minimum period.

*Discussions could be held between all interested bodies, (AHDS, AHRC, JISC etc) to decide upon the form in which logs should be kept, and the minimum retention period for them. (If necessary LAIRAH would be happy to provide further advice on this matter)

Broad vs deep usage:
* When choosing which resources to fund, the AHRC might bear in mind the distinction between resources on popular subjects that are likely to be used by a wide constituency, and those that are essential for a smaller research community. Each type of resource is important, but for a different purpose.

* Experimental research for which there may be no reuse possible could therefore be distinguished from resources for which a use is expected. In the latter case applicants might be asked to provide evidence of the type of use expected, and size of the potential community.

Library and Information resources:

* Information resources, such as libraries, archives and research centres have not been replaced by digital resources. We therefore recommend that digital resources ought not to be seen as an alternative to libraries and archives: both digital and analogue information resources and services will continue to need funding.

* Librarians are trusted as sources of information about digital resources. They therefore require training in digital resources for the humanities in order to inform scholars about appropriate resources for their research.

Documentation:

*The AHRC might consider making documentation a compulsory deliverable of a funded project.

* Discussions could be held between relevant stakeholders and the AHRC, with the aim of producing an agreed documentation template. This should specify what should be documented, to what level of detail.

Sustainability:
* The issue of sustainability is vital, and further discussions might be held with the AHDS about whether it is possible for subject centres to collaborate with projects, to help to ensure sustainable resources. This would also require further investigation of funding models for long term maintenance and updating.

Users:
* The AHRC might consider requiring evidence of how user contact and feedback will be carried out, as part of the application form. The results of such contact could then be included in the final report as a condition of satisfactory progress.

Training and career development:
* The AHRC might consider requiring universities to offer more training for graduate students and RAs in digital humanities techniques.

* The issue of career progression for former research staff might be considered by the AHRC, and the possibility of short term funding similar to platform grant might be worthy of investigation. Although an initial extra cost, this might avoid repeated funding of similar training for new researchers.

3. Introduction

Digital Humanities is a relatively young but very productive discipline. In its short history scholars have produced thousands of digital resources which have been funded by governments, philanthropic bodies and universities. In the UK alone, over 250 digital humanities projects have been funded by the Arts and Humanities Research Council (AHRC)[1] since 1998. According to JISC[2] and CURL[3], "in the UK…the investment in digitization projects has amounted to £130 million of public money over 10 years." (JISC and CURL 2005, p.2) Yet what happens to such resources after completion is very poorly understood. (Warwick, 1999b) Anecdotal evidence suggests that some projects become well known but others have been relatively quickly forgotten. This is regrettable since the non-use of a resource represents a waste both of the considerable intellectual effort and time expended in its production, and potentially considerable amounts of funding. No systematic survey of digital resource usage in the humanities has been undertaken, and the characteristics of a project that might predispose it for sustained use have never been studied.

This report presents the results the LAIRAH (Log analysis of Internet Resources in the Arts and Humanities) project (http://www.ucl.ac.uk/slais/research/circah/lairah/) based at UCL's School of Library Archive and Information Studies: a fifteen month study to discover what influences the long-term sustainability and use of digital resources in the humanities through the analysis and evaluation of real-time use.

Our research objectives were:

- To determine the scale of use and neglect of digital resources in the humanities.
- To determine whether resources that are used share any common characteristics.
- We also aimed to highlight areas of good practice, as well as aspects of project design that might be improved to aid greater use and sustainability.

3.1 Previous work in the area

Although useful recent work on humanities scholars has been done by Barrett, (2005) Talja and Maula (2003), Greene (2000) Herman (2001) and Ellis and Oldman, (2005) this tends to concentrate either on information seeking practices or information needs of humanities scholars. Seminal work done by Stone (1982) and Watson Boone, (1994) showed that humanities users need a wide range of resources, in terms of their age and type. This remains true in a digital environment, where humanities users continue to need printed materials, or even manuscripts as well as electronic resources, which by their nature may imply a much greater age of materials than those used by scientists. (British Academy, 2005) Bates (1996) has analysed the activities carried out by humanist scholars in digital environments, using the Dialog system, which predated the web. While extremely valuable, this is now somewhat dated.

A major theme of the literature about humanities users is that they are not like those in the sciences or social sciences, although many designers of electronic resources have assumed that they are (Bates 2002). Humanities scholars are much more likely to use what Ellis has called 'chaining', and proceed by following references that they have found in other literature (Ellis & Oldman 2005). Yet this is at odds with keyword queries that tend to be the norm for information systems, and has therefore been seen as evidence that humanities researchers' techniques are somehow impoverished (Chu 1999). Yet as long ago as the mid 1980s Wiberley showed that humanities scholars constructed searches using well defined terms, but these terms were different from those used by scientists, being more likely, for example to include names of places or people (Wiberley 1983 & 1988).

Lehmann & Renfro (1991) and Wiberley (2000) suggest that humanities scholars are receptive to technology as long as it demonstrates adequate savings in time or effort. Bates' work and that of Dalton and Charnigo (2004) and Whitmire (2002) has also shown that those humanities scholars who use digital resources tend to be demanding of the quality of resources and are capable of constructing complex search strategies, given appropriate training.

We are not aware, however, of any literature that has used quantitative methods, particularly deep log analysis, to measure the levels of use of digital humanities resources. Our research also attempts to investigate not just which resources users need, or how they search them, but their detailed opinions about such resources, such as the qualities that they appreciate and factors that may inhibit use. We have also considered digital resources from the point of view of their producers, whom we interviewed to determine if there are any factors in the experience of constructing and planning a resource that are common in the case of projects that are well-used.

4. Methods

We used Deep Log Analysis to assess use levels of digital resources in the arts and humanities. This technique has been used extensively by the UCL SLAIS CIBER[4] research centre in other areas such as health information and commercial publishing, (for example Huntington, et al. 2002). This allowed us to identify patterns in usage of digital resources in the humanities, and identify a selection of used and non-used resources.

4.1 Deep Log Analysis

All digital information platforms have a facility to generate logs that provides an automatic, real-time record of use. (See appendix 1 for a sample file.) They represent the digital information footprints of the users and by analysing them it is possible to track their information-seeking behaviour. When enhanced, logs can tell us about the kinds of people that use the services. The attraction of logs is that they provide abundant and fairly robust evidence of use. Logs record use by everyone who engages with the system, thus it is possible to monitor the behaviour of millions of people around the world. They not only have an unparalleled size and reach, but are a direct and immediately available record of what people have done: not what they say they might, or would, do; not what they were prompted to say, not what they thought they did. The data are unfiltered and represent the users' behaviour and complement important contextual data obtained by engaging with real users and exploring their experiences and concerns.

Server log data are records of actual web pages viewed. These records occur as a result of requests made by the client's computer and provide a record of pages delivered from the web server to the client's computer. The server records the Internet address of the client's computer. These addresses follow an Internet Protocol (IP number) and relate to registered domain name server (DNS) information. The DNS information gives information such as organisation name, organisation type (i.e. academic or commercial) and country registration. The information is stored as an ascii text file in a compressed format. For this study the archived Humbul logs took up about 150MB or about 20% of a compact disk. Neither the DNS address information nor the IP number records information can be used to identify the actual user. (Albitz and Liu, 2006) To preserve anonymity further the logs that we analysed were purged of any personalisation data.

We used the logs from the three main portals for digital humanities in the UK, the AHDS [5]central servers, the Humbul Humanities Hub[6] and Artifact[7]. In the case of the AHDS and Humbul we were able to analyse a year's worth of data, using the SPSS software package. However, in the case of Artifact much less was available, due to the fact that they did not have the technical support to maintain their own logs. The data from Artifact became available when it merged with Humbul, but we had only three-months' worth and it appeared relatively late in the project's life. For the purposes of this report therefore, we will concentrate on results gained from the Humbul and AHDS logs. Ideally we would have liked to use logs from the servers of individual digital humanities projects.

However, gathering log data even from the three portal sites was a time-consuming process, and to do so from individual projects would have been unworkable given our deadline. As a comparison with the log data we also mounted a questionnaire on the AHDS, and Humbul websites, and on that of the RePAH project, in which we asked about use patterns of resources.[8]

4.2 Qualitative Methods

4.2.1 Neglected resources workshop

Once we had identified a sample of projects, we held two workshops to investigate whether neglected resources could be reintroduced to users and to determine whether users could identify factors that might explain their neglect. Our definition of neglect was that, from the evidence of the log data and information from the AHDS subject centres, users did not appear to be making links to or requests for such a resource, as opposed to well used resources, which were being accessed repeatedly.

We used a mixture of used and neglected resources and did not tell participants which resources were which, since we did not wish users to be prejudiced against the quality of resources that were neglected. We also chose resources about similar themes, including such areas as warfare and census data, which log data indicates are popular areas. For further discussion of the workshop methods, see appendix 2.

Neglected projects:

- Art and Industry in the Eighteenth Century[9]
- Collected Poems of Wilfred Owen[10]
- Correlates of War Project : International and Civil War Data, 1816-1992 [11]
- Exeter Cathedral Keystones and Carvings [12]
- Other Educated Persons[13]

Accessed projects:

- GIS of the ancient Parishes of England and Wales, 1500-1850[14]
- Imperial War Museum concise art collection[15]
- Toronto Dictionary of Old English Corpus [16]
- Channel Tunnel Rail Link Archive[17]
- Designing Shakespeare[18]
- English Monastic Archives[19]

4.2.2 Interviews

The quantitative data enabled us to identify a sample of projects to be studied in greater depth. We selected a sample of twenty one projects with varying levels of use, chosen to represent different subject disciplines.

- Old Bailey online[20]
- Andre Gide Editions project[21]
- French Stars Project[22]
- The English Monastic Archives Project
- The Survey of English Usage[23]
- The London College of Fashion Archives[24]
- Excavations at Eynsham Abbey[25]
- Toronto Dictionary of Old English Corpus
- The Ave Valley Project[26]
- The Avant Garde Project[27]
- The DIAMM Project[28]
- The Channel Tunnel Rail Link Archives
- Designing Shakespeare
- Exeter Cathedral Keystones and Carvings
- The Suffrage Banners Project[29]
- The Jeremy Bentham Project[30]
- PARIP[31]
- The Powys Digital History Project[32]
- The Celtic Inscribed Stones Project[33]
- The Imperial War Museum Concise Art Collection
- GIS of the ancient Parishes of England and Wales, 1500-1850

We interviewed a representative of the project, either the principal investigator (PI) or a research assistant (RA). (See appendix 3 for the interview guide)

5. Results

Absolute usage levels of the resources were unexpectedly hard to assess. The period of our research coincided with major changes in the way that all the portal sites functioned, with Humbul and Artifact merging to become INTUTE Arts and Humanities. The AHDS also made major changes in its central website functionality and developed of a shared system for resource delivery to allow users to download and study resources from a single point. It is also possible that increasing numbers of visitors accessed the AHDS collections through the subject centres themselves. Analysis of these centres was not originally part of the LAIRAH project, and a supplementary report will be delivered on them. Altogether the AHDS holds 1,225 collections, however, from the central site it is difficult to gain an accurate sense of collection usage, since many pages shared the same name irrespective of subject, thus a record of subject usage could only be done at the directory level. Also certain page names, for example 'Exeter', may refer to more than one resource. (For a list of sample pages viewed see appendix 1.2.)

Research by the RePAH project has found that during the study period, 7,463 separate resources were accessed via the Humbul site out of a total of 11,680 which were publicly available when the merger took place. This suggests that 36% of the Humbul resources were neglected during our study, although we cannot prove that they have never been accessed. It is also possible that resources are being accessed directly and not though subject portals. It is also important to remember that some specialist humanities print publications are never used, a fact recognised by the short print runs usually allowed for humanities monographs. Even in science, an average of 27% of articles are never cited, a figure that rises as high as 44.52% in Computer Science. (ScienceWatch, 1999)

However, in the case of journal or monograph publication, a commercial publisher takes the financial risk, and sells journals or books to a library, irrespective of whether they are read or cited. In the case of digital humanities large amounts of public funding is wasted if a resource is not used. Thus our findings aim to increase knowledge of user reactions to such resources, and to share the kind of good practice which should help to ensure that digital resources created in future have the best possible chance of being used.

5.1 Findings from the Log data

5.1.1 Names and subjects

Certain names and themes of popular projects recurred in the log data. Warfare, for example was a popular theme, as was census data and terms relevant to family history. Place names such as Exeter, Canterbury, Gloucester, were noticeable in the AHDS data, as were terms suffrage and suffragette. Witchcraft and magic produced a large number of links through the Humbul pages; 53% visits to www.arts.ed.ac.uk (Edinburgh University), 85% of visits to Greenwich University's web page. Other popular areas from the Humbul logs concerned subjects such as medieval monasticism, the English language

and French film stars. A project on Jeremy Bentham based at UCL was especially well used, which is understandable given his link to UCL's foundation.

Information provided by the AHDS subject centres helped underline this phenomenon. AHDS Performing Arts[34] told us that *Designing Shakespeare* is one of their most used projects. AHDS Visual Arts[35] told us that the *Imperial War Museum Concise Art Collection* was often requested, as was the *London College of Fashion Archive*[36]. War, Fashion and Shakespeare are all very popular subjects. The list of well used and neglected projects provided by AHDS History demonstrated an interesting contrast. *The Great Britain Historical Database: Census Data: Occupational Statistics* was, unsurprisingly, well used but a similar project, entitled *Enumerator Returns for County Antrim* was neglected. This suggests that not only the subject but the name of the resource is significant. The latter project may not have been found because, when searching, the more intuitive term to use is 'census data' and not 'enumerator returns'. A project archived by AHDS Visual Arts called *Other Educated Persons* is also neglected. The search terms used to retrieve information on art in London – its subject- would be unlikely to include the words "other educated persons" and it is almost impossible to infer the content of the resource from its title.

However, information from the subject centres at times contradicted the evidence of the logs. AHDS Literature Languages and Linguistics felt that a collection of Wilfred Owen's poetry was little used. Yet the AHDS logs showed the term 'Wilfred' relatively high on the list of pages viewed. Visual arts felt that the *Exeter Cathedral Keystones and Carvings Project* was seldom used, nevertheless the term 'Exeter' was significant in the list of pages visited. (Although we cannot be certain that this refers to the same project)

5.1.2 Names and resource description

Regardless of the usefulness of the subject matter, the issue of naming and description of a resource is important, if potential users are to understand what it may be used for. In the arts and humanities, print publications often have unusual titles, to attract the readers' attention. However, an unimaginative but accurate description of digital resources is more advisable. While humanities scholars have complex models of information processing in the world of print, these are not yet as easily transferred to the digital realm. (Buchanan et al. 2005, Blandford et al. forthcoming). Thus users find it easier to guess the contents of print publications, given their greater experience of them, but find it much harder to guess the contents, purpose and scope of digital resources. Therefore if a user is browsing a digital collection and finds a resource whose title does not accurately describe it, they may become confused, and discouraged, and may not explore any further. (See the results of the workshop, described below.)

5.1.3 The importance of information resources

We generated a list of the forty top level domains accessed from the Humbul logs. Half of the domains listed below are for sites of libraries, archives, e-text collections, portals or publishers.

Table 1. Top 40 resource sites accessed via Humbul

URI Site	Number	Percentage
www.bbc.co.uk	4166	1.5
www.wsu.edu	2473	.9
www.geocities.com	1969	.7
www.nd.edu	1517	.6
ads.ahds.ac.uk	1216	.4
www.bl.uk	1047	.4
www.arts.ed.ac.uk	1042	.4
www.pbs.org	1031	.4
www.emule.com	936	.3
memory.loc.gov	836	.3
www.fordham.edu	813	.3
www.shef.ac.uk	811	.3
www.channel4.com	789	.3
www.newadvent.org	713	.3
www.llgc.org.uk	680	.3
www.spartacus.school	659	.2
www.luminarium.org	659	.2
etext.lib.virginia.e	649	.2
uk.cambridge.org	643	.2
www.ucl.ac.uk	636	.2
www.iwm.org.uk	624	.2
www.loc.gov	614	.2
ccat.sas.upenn.edu	606	.2
www.gre.ac.uk	599	.2
www.archives.gov.on.	575	.2
www3.oup.co.uk	573	.2
www.archives.gov	563	.2
www.accd.edu	560	.2
www.nationalarchives	559	.2
www.georgetown.edu	546	.2
www.hti.umich.edu	540	.2
www.sas.ac.uk	536	.2
www.kb.nl	520	.2
etext.virginia.edu	506	.2
www.bu.edu	504	.2
www.stoa.org	503	.2
history.hanover.edu	499	.2
raven.cc.ku.edu	490	.2
learningcurve.pro.go	485	.2
www.17thc.us	479	.2

		12.6%

We then extracted details of the sub directories belonging to the UK universities: in order of popularity, Edinburgh, Sheffield, UCL, Greenwich and the School of Advanced Study (University of London). Within these domains, information resources were also frequently visited. Almost all of the School of Advanced Study pages were for the web pages of subject research centres, such the Commonwealth Institute.[37] At Sheffield for example, Assemblage[38] (an archaeology journal), was the second most popular resource, and we also found another journal, three subject associations and a research centre were amongst the most popular resources.[39]

This data was supported by findings from the questionnaire, in which it is notable that 14% of the users identified their university library website as the most important resource.

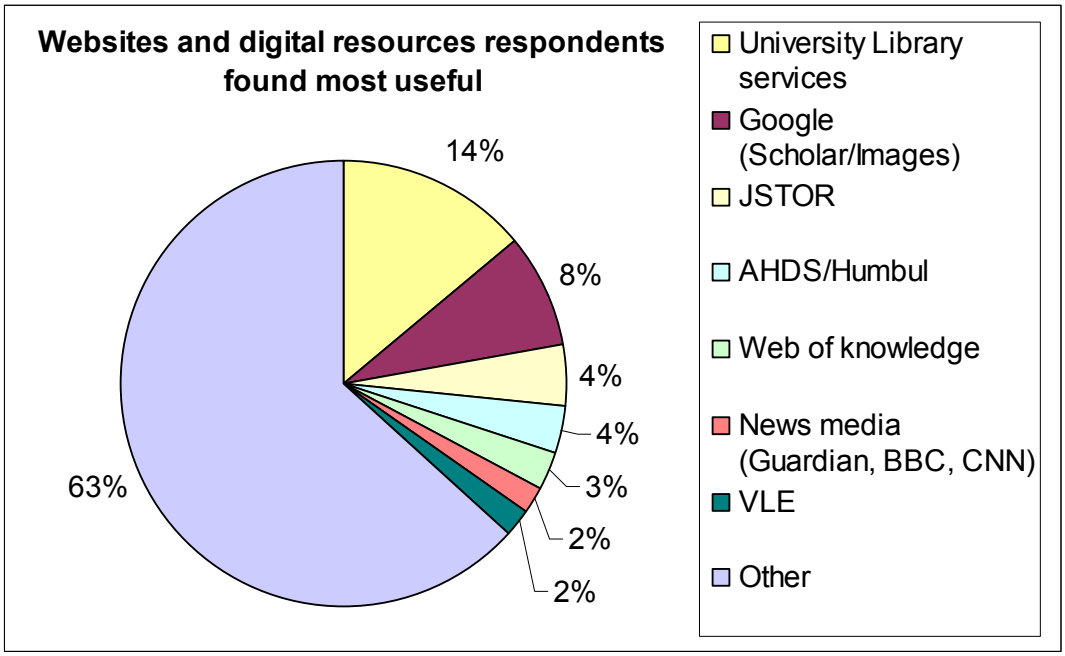

Fig. 1. Digital resources which users find most useful

The majority of the resources listed under 'other' are information resources such as libraries, archives and subject portals, whether publicly funded or commercial. For example, the British Library[40], the National Archives[41], JSTOR[42], the AHDS, Literature Online[43], Palatine[44] Voice of the Shuttle[45] and Perseus[46] Most users appear to regard digital resources primarily as a way to access information, (British Academy, 2005, Rimmer et al. 2006) which in the analogue world might be compared to the library or archive, rather than specialist research resources which we might compare to a monograph or a literary text.

5.1.4 Creation versus reuse

Most of the pages viewed on the AHDS website, and those highest in the frequency list, concerned deposit and creation such as 'how to deposit', staff contact details, and information about copyright. However, this is contradicted by our questionnaire data which indicates that only a minority of users (32%) believed that data archiving was central to their research.

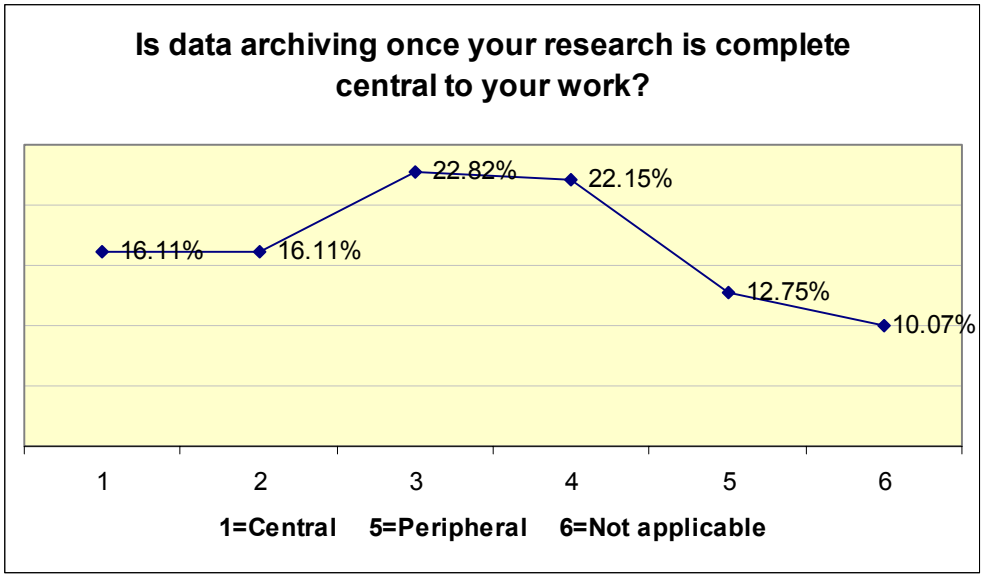

Fig. 2. Response to question about whether data archiving is central to research

There may be a scholarly bifurcation between those who create specialist digital resources as part of their research, but do not tend to reuse, and those who prefer to use more generic information resources, but are less concerned with deposit and archiving.

5.2 Workshop findings

5.2.1 Critical judgement

Although initially somewhat wary of making judgements about whether resources might be used or neglected (see appendix 2 for details) participants were highly critical of the resources offered, and none met with universal enthusiasm or approval. Even in cases where a resource might be useful for their work, participants provided informed critiques of its strengths and weaknesses. When unsure about whether a resource was neglected or used, participants at workshop one tended to assume lack of use, and thus identified half of the used resources as neglected. This was unexpected, since Adams and Blandford's study (2002) found that once participants were informed about the availability of digital resources they were keen to use them.

Problems noted by the participants concerned content, interface and ease of use. They required high quality resources, and tended to find resources that do not live up to this

standard disappointing. This may particularly be because, as the questionnaire data showed, many of the resources that participants used most regularly are commercially produced, and thus the content and interface are usually of a high standard. On the evidence of this sample, users seem unwilling to allow for any lesser standards, even if they know a resource is not commercially produced.

5.2.2 Names

Names proved to be significant to workshop participants, especially as a way of providing clues to the resource's purpose and provenance.

> I think I put neglected for it because although once you know it's there and you know what it's about it's an excellent resource in my opinion. I think the title is extremely misleading (W1)

For example, some participants were uncertain about the contents of the *Channel Tunnel Rail Link Archive*. Although it is a collection of records of archaeological digs along the route of the rail link for the channel tunnel, some of the participants assumed it might be about railway engineering. They therefore concluded that it might not be used, because its purpose was not obvious.

Participants at the student workshop were particularly adamant that more information ought to be provided for users of resources. This may be evidence of their training as information professionals, who are used to presenting information for non-expert users.

> The first thing that annoyed me about the Channel Tunnel site is that basically the first few paragraphs were about trains and how good the channel tunnel people are rather than saying "This is a website about archaeology". I can imagine someone who didn't actually know they were going there would just skip past that site unless they read the first few paragraphs they would just think it was fluff for the Channel Company and they would move on. Really that sort of stuff shouldn't be at that page, there should be links about us or something like that (W2)

Participants also commented favourably on naming in the case, for example, of the *Imperial War Museum Concise Art Collection*. Its name described the resources accurately and the Imperial War Museum was a trusted brand, reassuring users about the quality of the resources. This was one of the main reasons that they identified the *Concise Art Collection* as well used, and confirms previous findings about the importance of trusted brands on the Internet, such as the BBC for provision of news. (BBC, 2006)

The participants also commented on subject matter as a potential reason for neglect. They suggested that the *Exeter Cathedral Keystones and Carvings Project*, for example, might not be well used because the subject might only be of interest to a minority of scholars. Conversely they were reasonably confident that *Designing Shakespeare* would be used because of its popular subject matter. Nevertheless they also expressed concern that resources that were well regarded and used in a small community should not therefore be seen as inferior to those that were relatively superficially used by a larger community.

5.2.3 Audiences

A representative of the AHDS objected to the emphasis on names as a descriptor, and that metadata would inform users about the purpose of the resource. This lead to the following discussion:

> **FEMALE SPEAKER:** But the thing is archaeologists would know that and that's what they would search for and there is also there is about 120 sites in it and they have all got individual metadata so if you are going into our search catalogue and typed in [a keyword] which is a specific site you would find it. So it is easy to find I think even if you don't know that it's called Channel Tunnel Rail Link.
> **MALE SPEAKER:** You might be looking for a tanker.
> **FEMALE SPEAKER 1:** Yes I expected to find something about railways when I went in there I was really surprised, really surprised. It doesn't help you know.
> **FEMALE SPEAKER 2:** But if you are an archaeologist --
> **FEMALE SPEAKER 1:** But even if you are an archaeologist surely calling it something more obvious isn't going to put you off its not like it's a secret society or something you know.
> **[…]**
> **FEMALE SPEAKER 2:** Well it wouldn't go amiss to have something archaeology related in the title.
> **FEMALE SPEAKER 1:** You can, I mean, you can justify obscure titles anyway you like by talking about specific user groups and all the rest of it in context. But why have one? Why not just have one that actually describes what's there that works like a little bit of a shorter version of an abstract like you have with scholarly papers in the sciences etc. You have to describe what's there so that people know what they are looking at so it saves you time. (W1)

Participants in both workshops repeatedly commented on the fact that some resources seemed to have been designed for a certain type of expert user, and tended to deter the majority as a result.

> I think what's important with a lot of these sites is that there is nothing telling you how to approach it. Everyone looks for something in a different way and when someone puts together a resource or whatever it is they come from a particular perspective when they are doing it and you need other people to know what that is. You can't just say "I am a historian, you are a historian so you can use this." You need to say "Well this is where I come from, this is why I did this. This is some information about this." So that someone else can come up with their orientation to the site. Yes I think if you are going to put a site together or any sort of information together you should treat the people that are using it as complete novices. (W2)

Both groups also championed the cause of the non-expert and, argued that simple explanation of the site's purpose and guidance on how to use it is not detrimental to the expert academic or information professional, but is very helpful to the novice user of a new resource.

5.2.4 Metadata and citation

Several participants criticised the quality of resources' content, for example one project was still incomplete. Although some participants questioned how reliable searches of it might be, as a result, they welcomed the information about the state of the data. Participants were worried that there was insufficient evidence about the provenance of the data for several resources, and found that most of the resources were deficient in the kind of scholarly information usually provided by citations and bibliographies for print resources, about the provenance and selection of sources.

5.2.5 Access problems

Participants found that anything that made it hard to access a resource was unwelcome and could deter them from using it.

> Well I think probably it was [neglected] because […] it is simply a dataset and because there is no interface. Anyone who is going to use it has got to have very specific skills in building interface and know that the data underlying it is useful for what you want to do. (W1)

The history datasets were all thought to be little-used, because the complexity of presentation and the difficulty of using the material would outweigh any attraction, for all but the most expert users.

> Its much more that you have got to actually know about GIS which is extraordinarily complex and having tried and on the whole given up, I have used it but I know it's a huge investment for someone to do it you have got to have a major project to make people use it and there are much cheaper resources out there. Doesn't the title of that tell you what's in it and say "Well Oh I don't know too much about it I guess I am not going to worry about it. I am not going to waste my time."
> **MALE SPEAKER:** Or you could at least, you know, or you could click through to that there could even be a link, even just in line to basically say, you know, if you don't use GIS what you want … if you think you are looking for this, if this is what you are after but you don't know how to work GIS then go and look at this page.

Once again participants would have welcomed some concessions to the interested, but non-specialist user, but failed to find them. Thus the *GIS of the Ancient parishes of England and Wales* was thought to be neglected by participants, although AHDS History's[47] records show that it is one of their most popular resources.

5.2.6 Interfaces

The interfaces to the material were also commented upon. Participants liked the *Monastic Archives Project*, because the initial screen was simple and easy to use, and its subject matter obvious. The next page contained multiple search boxes to aid users to search the database. Thus the process of accessing and interrogating historical data was made as simple as possible.

> I think on this site the visual design was so much more intuitive and simple that it actually opened it up to a much [wider] user group, whether or not they are actually interested in content themselves they wouldn't need to be cut off from exploring that side and I think that's really important. Whether or not you are intending to disseminate your work more widely than the immediate scholarly community to me is irrelevant, I don't think it hurts to have a really clear easy to use interface. (W1)

Good interfaces are vital, and participants at the second workshop felt that it should be a responsibility of the resource creators to make the resource usable. This may reflect the interests and training of future information professionals:

> The responsibility has to be on the people who actually do the project because someone else just can't come at your work and say "How should I present it?" The presentation is part of the material itself. The AHRC has to make it very clear to people getting this funding that in order for them to get the funding it has to actually be usable and it has to be usable by a reasonable section of population who after all are paying for this to be done you know rather than just saying "Okay we will give you a load of funding and you can put a data set online". You know there has to be something to say "Well help people get at this." (W2)

A good interface is another way of ensuring that access to the resource is not artificially limited. Simply producing a dataset does not ensure that the resource will be used. However traditional humanities scholars have not had to consider what happened to their research after they have finished it. Interfaces can prove crucial; not only making the resource usable by as many users as possible, but integrating support and guidance as to how the resources might best be used. Thus again we return to the idea that unless there is a very positive decision only to limit access to the resource to experienced users, the design of a resource and its interface should not be allowed unnecessarily to constrain the types of use possible.

Given that one of the most attractive and useful interfaces, belonging to the *Imperial War Museum Concise Art Collection*, was designed by the AHDS Visual Arts Data service, it was suggested that the AHDS might collaborate in this process.

> If the AHDS was going to actually turn around and say "Well look we require some kind of accessibility to your material," people will turn around and say "Well yes okay I am not a web designer I am a researcher and whatever how should I do this?" Which then AHDS can come back with a corporate, you know a corporate look, if you like a standard form whereby material can be made accessible (W2)

One of the AHDS representatives also added that allowing projects to design their own interfaces could create potential problems when resources were deposited, and for potential users, because of variations in functionality and ease of use. However, the AHDS centres themselves did not have sufficient expertise about the project contents to design interfaces to them. Both workshops agreed that the ideal arrangement would therefore be for projects to work much more closely with the AHDS to design interfaces, as the quotation above suggests. This has happened in the case of some archaeological projects, which have paid AHDS Archaeology to design an interface for them.

5.2.7 Importance of the material

Respondents made clear that the factors described above might deter them from using a resource. However, if a resource was vital to them, or unique, they would be likely to use it despite the potential problems or disadvantages. For example, the participants thought that the *Toronto Dictionary of Old English Corpus* would be used, since although the interface was not especially attractive, the functionality was adequate to a linguist's needs.

5.3 Interview results

5.3.1 Project planning

Most projects had been carefully planned, and PIs reported that the finished product turned out much as expected or better. Several PIs stressed the importance of planning to their project's success, but that despite this, most projects had encountered unexpected difficulties or that technical aspects had taken longer than expected. Problems occasionally occurred during the planning stage if the PI had insufficient technical knowledge, or insufficient IT advice had been available, and in a few cases this meant that the resource could not be implemented in the form that had originally been anticipated.

> Well originally we did want [the database to be delivered via the web] but it turned out to be excessively expensive and actually the programming that would have been involved would have been far too complex for [the RA] and the data team at the University wanted to charge about £20,000 or something so, and there was no money left in the budget for that and […] we weren't aware of how big a job that would be to make it searchable on the web. (P21)

It became evident that the more detailed planning that was undertaken, and the more technically informed the planners, (whether PI or IT support staff) the less likely it was than projects would encounter such problems. PI's also stressed the importance of research staff, who should be able to understand both humanities research and be technically gifted. They also commented upon the problems of recruiting and training such staff. These issues were not part of the original remit of the LAIRAH project, but are discussed more fully in appendix 4.

5.3.2 Technical Advice

Technical advice was usually provided by local IT services, or more expert colleagues. Projects which had contact with humanities computing centres such as CCH[48] (Centre for Computing in the Humanities) and HRI[49] (Humanities Research Institute) were especially well-advised, and good practice from successful projects could be used to inform new ones. All AHRC applicants must take advice from the AHDS, and some had also been advised by national bodies such as the HEDS[50] (Higher Education Digitisation Service) JISC JIDI[51] JISC Image Digitisation Initiative) and New Opportunities Fund (NOF) [52].

Projects in the visual arts and archaeology had worked especially closely with their respective AHDS subject centres, and both centres were praised for their level of support and information provision.

5.3.3 Documentation

All but one of the projects had kept some kind of documentation. Older projects, such as the *Survey of English Usage* tended to document fully, since it has become vital to preserve the project's collective memory over its more than fifty year life. However in the majority of cases documentation was partial or fragmentary and might consist of emails, the minutes of meetings, planning documents or progress log books. Some original plans and documents had also subsequently been lost. Documentation was therefore unlikely to cover all aspects of the project, and might not be easy to understand by anyone not involved in the project. As one interviewee put it:

> Yes well, I mean, they might be too chaotic to, you know I mean we didn't really create those for the public it was just rather for us so that we knew what we were doing but, you know they are not really, don't think they are kind of useful for anybody else. (P21)

Although almost all the interviewees were aware of the importance of documentation, they had been unable to document as fully as they wished because of lack of time. Since documentation was not part of the project deliverables, nor was it as vital as peer reviewed publications, it tended to be neglected.

> I do remember it was quite fraught latterly because there were […] the publisher's deadlines to meet and so on and ironing out the bugs. It was very much a seat of the pants business really. So it was very much operational really rather than, we didn't have the time […] we were in new territory for us we were so anxious to get the thing done that we didn't really have the leisure or indeed the foresight to plot what we were doing. (P22)

5.3.3.1 Subject based

Projects produced by archivists, archaeologists and linguists were documented most fully. The process of documentation is central to the study of archaeology, and would be expected by users.

> Yes well that's the sort of scientific paradigm, in a sense that if you are given a pile of Roman pottery then saying what you are doing while you are doing with it and documenting it is seen as part of the, you know, the rigour of the study. (P20)

This applies equally to the work of linguists and archivists. Documenting decisions is an automatic part of the work of such disciplines, and therefore producing documentation for a digital resource is regarded as a normal component of the project.

5.3.3.2 Access to documentation

Access to documentation was especially problematic. If decisions were documented in an informal way, the resulting documents, either paper or electronic, tended to be kept by the individual PI, or their institution in a way that was not advertised, and thus evidently not accessible to future researchers. One of the most innovative features of the HRI when it was established was that all documentation about projects was to be deposited with the library. The only disadvantage of this admirable policy is, however, that a potential user would have to visit Sheffield University if they wished to consult documentation, and the facility to do this is not widely publicised.

Other examples of good practice in the area of documentation were once again in archaeology, linguistics and archives. Documentation for all the projects was available from the AHDS Archaeology website and in the case of the *Channel Tunnel Rail Link*, and the *Celtic Inscribed Stones* project there were links from the project website itself. This was also the case with the *Powys Digital History* project and the *Toronto Dictionary of Old English Corpus*.

5.3.4 Contact with users

We identified four different types of contact with users, which we describe below:

5.3.4.1 Designer as User

This was the most common method used. Projects felt that they could infer what users might wish to do with the resource from their own behaviour and knowledge of the subject.

> We constantly had discussions about whether the categories made sense and you know how to improve them and we discussed, yes you know little inconsistencies and stuff like that so that was kind of an ongoing process. (P21)

Although this method shows some awareness of user needs, designing for a small group of subject experts is very ill-advised, since a designer, however reflective, cannot be sure what users may need without contacting them. (Schneiderman and Plaisant, 2005) Several resources in our study had also found a wider audience than expected.

> Its impact is not what I expected. I remember for NOF we had to do a projection of visitor numbers you know and we kind of we just pulled them out, we had no idea, we had absolutely no idea and of course they were just tiny in comparison to what's actually happened and it has really taken off. You know I mean this is obviously just to learn how effective the internet is at spreading information but it just turns up in all the most unlikely places like you know the last week came an email saying "Did you know that your websites been cited in arguments before the United States Supreme Court". (P6)

As we saw in the workshop, aiming the resource at subject experts may artificially limit future use, and resource creators may be wrong in assuming that even other subject experts will use a resource in the same way they would.

There is also a danger that the resource may be designed in an unnecessarily complex fashion, as the experience of one RA shows.

> Looking back at it we should have really done a proper user needs sort of survey thing before hand rather than just launch into this thing. […] a lot of it was complicated luxury that you didn't really need and so I think we could have saved ourselves a lot of work by going to the users to start with and saying you know "What is it you would really like out of this?" (P19)

Thus a more formal user survey might have saved the team a great deal of unnecessary effort.

5.3.4.2 Informal User Feedback

Another method of contact with users was when projects presented conference papers or ran workshops. These were valued by interviewees as a way of gathering feedback on the resource from questions or comments, and this strategy was especially popular amongst projects in history. This kind of feedback requires the project to be at least partially complete, and it may be difficult to make significant changes in a project's construction, at this stage. However, it is very difficult to draw any significant design decisions from this kind of unstructured information and there is little active interaction between users and producers.

5.3.4.3 'Contact Us'

Several projects encouraged user feedback by having an email link on the project website. This allowed users to comment on problems with functionality, to submit comments on the resource, or ask questions about it. The use to which such feedback might be put was varied. The *Old Bailey* project was an example of particularly good practice, since user comments were collected and used to inform yearly updating. A few projects (four in total) such as the *Survey of English Usage* maintain contact with a group of users via an email list, and the *Survey* also maintains a bibliography of publications which have been written as a result of the use of their resources. Thus they have an unusually clear idea what their data is used for.

5.3.4.4 Direct User Feedback gathering

Only a few projects carried out formal user tests. PARIP carried out a user needs survey at the beginning of the project, and the Channel Tunnel project conducted focus groups. These are both examples of especially good of practice: their creators were aware of the needs of their users and could take design decisions accordingly from very early in the project.

Three projects took an informed decision not to carry out user tests. They were associated with large digital humanities research centres and/or were able to benefit from the adaptation of interfaces and systems which were known to work on other, similar projects. Six others sought feedback from users at the stage where a pilot version or new

software release was ready. This was either done by holding workshops or by sending out email to a known list of users.

> We had a group of meetings and we asked them to look at the software and give us feedback. […] They contact [the RA] about things to do with the functionality on how to find this or that, and then they tell him, "Well how about this?" A lot of things, "How I can do X Y or Z" (P2)

In one case, the funders, NOF, insisted that user feedback must be sought, and the PI commented that this had resulted in them thinking about a wider range of users, and carrying out more tests than they otherwise would have done.

5.3.5 Maintenance and sustainability

Most of the projects that we studied are finished, and very few are being actively updated. One former RA's interview is quoted at length, because it is stark demonstration of the problems caused by a lack of updating.

> I was very concerned right from the very beginning ten years ago about who was going to maintain this and how it was going to stay available and how it was going to be updated that never really got resolved and as a result we are in this sort of very unfortunate situation where the AHRC spent £200,000 whatever it was employing two of us for three years and within ten years of the start of the project half of it doesn't work anymore.
> **MODERATOR:** Did you talk with anyone about trying to maintain it further?
> **MALE SPEAKER:** Well I talked to my bosses about it yes and they worried about it a bit but in the end they just decided that the easiest way of doing that was to give it to these people in Glasgow but I have no idea whether it's just sitting on a hard disc in Glasgow and nobody has touched it or where there is actually anybody working on it. They weren't helped by the fact that the man […] who did the web design for us then took early retirement. […]
> Every so often I have sort of guilty pangs in the back of my brain that I really ought to try and find out why the web interface has stopped working and whether we can actually get it up and running again but I am so involved in my own projects and this wasn't my project and it doesn't contribute to anything that counts to anything as far as I am concerned. It's not going to add to my RAE rating, it's not going to give me any value points in the [academic organisation] but I come out in a cold sweat every time I think about it and I just, you know it's, even the webpage of the site hasn't changed in six years. (P19)

Thus the functionality of a ten year old resource is already significantly degraded yet no-one is responsible for correcting problems, nor is funding available to do this.

This former RA is technically knowledgeable. However, few of the PIs appeared to recognise that ensuring that the resource was backed-up on the university web server and archiving resources with AHDS does not constitute a strategy for maintenance and updating. It guarantees that the resource is preserved, but not that it will remain fully functional, as software systems and delivery interfaces change.

One of the few PIs to recognise the importance of active updating and maintenance made the following comments:

> I think it is important that you [update] partly because I when you look at a website and it says last updated more than 12 months ago you just immediately think this is being allowed to wither on the vine and you don't trust it. So I want to be able to if nothing else to say on our homepage, last updated or we have the version number 4.2 you know date July 2006 is a way of assuring the users that we are still paying attention. (P6)

This demonstrates the way in which the web as a medium has changed the way we perceive the currency of digital resources. When news sites are updated every few minutes, users have come to expect instant updating and information that is absolutely current. Thus even if the resource itself is still maintained and functional, if the website looks outdated then users may lose confidence in its contents.

Even the present system of deposit with the AHDS references an earlier model of digital production in which the datasets from social scientific research were deposited with a data archive once research was completed. This static dataset could then be downloaded and re-used by researchers on their own computer, as is still the case with many digital resources in history. The AHDS itself was designed in the mid 1990s when the impact of the web was yet to be widely felt, and it would have been assumed that humanities digital resources would be similar, and perhaps delivered on a medium such as CD-Rom which is much more difficult to update.

However, most digital humanities resources are now delivered on the web, and the old models of deposit are, arguably, no longer sufficient. In the case of most large digital resources, the data is no longer independent of the software or the interface that delivers it, and the changeable nature of web delivery means that a static resource produced at the end of a research project will become outdated relatively quickly and may become unusable, although project creators appear not to realise this.

5.3.6 Dissemination

All the projects that we interviewed during the study shared a commitment to disseminating information about their work. It was not surprising that some of the best known projects had pursued the most determined and varied dissemination strategy. Many PIs had become enthusiastic promoters of the resource, giving papers at workshops, conferences and seminars both subject-specific and digital humanities domains. This ensured that information was disseminated to as broad a community as possible.

Some projects had also sent out flyers to departments, libraries and archives, others had made use of email lists and the web. The most unusual form of dissemination was reported below.

> […] one of the women from [the] village phoned me up a few months back and said, we want to make a tea-towel out of one of the pages of your book about the [archaeological site], do we have your permission? I said yes, if you give me a tea-towel, so it is still generating a product itself. Yeah, not many of our projects end up as a tea-towel. (P13)

Some projects had also been publicised as a result of their links with the AHDS, for example the *Ave Valley* project was used as an exemplar at AHDS training events.

5.3.6.1 Age of Resources

This enthusiastic promotion may also help to account for the fact that many of the well-used resources in our sample were relatively long-lived, and in the case of the *Survey of English Usage*, extremely so. One of the interviewees reported that as a result of her work on the project, she is now asked for her recommendations about the best digital resources in her subject:

> […] increasingly what people want is guidance through the huge number, [of digital resources] people are just bewildered by the amount of information that's out there and what to do with it. So I find that people have gone from just sort of saying, "Wow that's great that you have done this" to, "Yes that's great that you have done this but how does that work with, you know the X collection or how do I incorporate that with these other things that are going on?" And you know, basically give me a list of […] your top ten. (P17)

It may therefore be that older resources become better known and thus better used because they were amongst the first resources in the area. Thus they were used by the early adopters who are the very people who are now asked to recommend good resources. As long as such resources remain viable, therefore, they are likely to be used more than newer entrants to the area.

The persistence of older resources may also be explained by analogy with commercial phenomenon known as 'switching costs'. Users tend to stay loyal to products or services that they have adopted even when other viable alternatives are offered. This is because the cost of switching to a new product is too great, if the old one is reasonably adequate. (Yanamandram and White, 2006) In the case of digital humanities resources, the cost to the users is that they may have discovered a resource when it appeared and are unwilling to expend the time or effort to learn how to use a newer resource, as long as the older one fulfils their needs reasonably well.

5.3.7 PIs as exemplars

PIs thus proved very influential in disseminating information about more general good practice in the creation and use of digital humanities resources. With only two exceptions (one of whom had retired) PIs told us that they had been inspired to do more work in digital humanities. In many cases, notably in Sheffield, other members of staff had also been inspired to follow their lead. For example, Mark Greengrass was consistently mentioned in Sheffield as a notable early adopter who then communicated the possibilities of research involving computing to his colleagues in other humanities disciplines. The success of early leaders underlined the prestige of work in digital humanities, not least because of the availability of grant funding for humanities research.

In some cases there was already a culture of digital work in the department (as at UCL History) or the field (archaeology) and in which case PIs felt they were not leaders so

much as participants in an already established research culture. The culture of the institution also proved to be important. The HRI is highly valued by Sheffield University, from the Vice Chancellor downwards. However, in another university one successful digital project was seen as outside the core research of a rather traditional department, and the acquisition of grant funding had not, until recently, been perceived as especially prestigious by the faculty. As a result, no other digital projects had begun at the department and few colleagues or graduate students showed an interest in the area. We therefore found a clear correlation between institutional encouragement of digital humanities research and the creation and use of digital resources.

6. Conclusions

6.1 Log availability

Log data is potentially a valuable research resource however, it is often undervalued and not maintained or made available. We found that it is surprisingly difficult, and very time-consuming, to extract log data even from large publicly-funded centres, due to problems of insufficient technical support or concerns about anonymisation. If projects are publicly funded then they should make their log files available, as evidence of the amount and type of usage of the resource. It would therefore be advisable for discussions to be held between the various stake-holding bodies, such as the AHRC, the AHDS, JISC, INTUTE Arts and Humanities and perhaps learned societies representing humanities subjects to agree upon a policy for log retention and maintenance. For example, in what form the logs should be kept, how long for, and to whom they should be made available to; whether funding bodies, researchers or the general public, for example in annual reports.

6.2 Nomenclature

The importance of naming and description of projects emerged from both the logs and the workshops. Potential resource creators must be aware of the importance of what they decide to call their resource, since it may have a profound effect on its future use or neglect. Although metadata can help to describe a resource it appears that non-expert users may not progress as far as accessing this. It is also important to stress the importance of organisations like universities, museums, libraries and archives; brand names that users trust to produce good quality resources.

It may seem obvious that resources addressing popular subject matter tend to be used more than those on more obscure subjects; however it is potentially significant in terms of future research funding. There are also undoubtedly excellent projects whose subject matter is not well known outside the immediate research community. Yet they may be vital to the work of that research field. When deciding on issues of funding, this kind of use must be weighed against the likelihood that a resource on a popular subject is more likely to be re-used although its use might be broad and shallow. There is also a danger of a kind of ‘electronic cannon’ being formed, where less well-known authors or subjects are marginalised by yet more census data and Shakespeare. (Warwick, 1999a) Funding bodies may therefore have to make decisions about the value of study of more recherché topics. They may need to develop a sense of collection building that has hitherto been the concern of librarians in the print world.

It is equally important that we recognise the value of experimental research, where a resource is created to test a technical or intellectual issue in knowledge representation. This kind of conceptual research is valuable, and it may be that no reuse can be envisaged. However, when bidding for money to produce digital resources those who propose their creation may suggest that they will be widely used, in order to justify the

level of funding sought. To draw a clear distinction between material intended for a wide audience and that created to solve a research question it might be possible to ask for more evidence of usage, or to make it clear that for 'pure research' projects re-use should not necessarily be a prerequisite for funding.

6.3 Information resources

The preference amongst users for information resources over specialist research resources has various consequences. In terms of funding priorities it suggests projects which collect together large collections of information resources for reference, whether generic or subject based are likely to be well used. Our findings also demonstrate the importance of traditional scholarly structures in humanities research and the use of the web for information about journals and academic conferences. This confirms Barrett's (2005) findings that humanities users still need traditional, generic resources and value personal knowledge repositories and face to face meeting as highly as digital resources.

It also underlines the importance of physical information resources such as libraries, archives and research centres. Access to research centres, such as those at London University's School of Advanced Study, is still very significant in the research of humanities scholars. However, more attempts might be made to integrate their physical function with that of a digital mission, following the example of the IHR (Institute of Historical Research)[53] in London and the HRI in Sheffield. University libraries are the primary point of access for digital resources for many users, and national and specialist libraries and archives are also highly valued. Digital resources have also not replaced the library as an important research resource. If anything libraries' function as digital information gateways has increased their importance.

In a separate study (Pappa et al, 2006) we tried to find specialist digital resources for humanities research, beginning with either the departmental home page or the university library. We found it relatively hard to find such resources, even for an expert information seeker. This might help to explain why so many of the resources being used are information collections, as it may be that these are the kind of resources that librarians, as information specialists themselves, consider most valuable, and therefore create links from the library web page to them. Thus the users tend to follow the links provided. If these do not include specialist digital humanities resources users may not look further for them, since they trust the judgement of librarians. It is therefore important that librarians should be aware of specialist digital research resources and provide links from the library site. This may require more specialised training for subject librarians, which suggests that modules on electronic publishing and digital resources in the humanities should be available to library school students, as is the case at UCL SLAIS.

6.4 Critiques of digital resources

Humanities scholars are capable of providing detailed, informed critiques of digital resources. They demand the highest possible quality, both in terms of content and

interface and may be relatively easily deterred from using digital resources if they are not convinced of their value. They therefore assumed that more resources were neglected than was actually the case, and this was generally a judgement made as a result of their concerns about resource quality. This may be because users have become accustomed to the kind of high quality content and interfaces provided by commercial publishers or organisations like large libraries and archives, and are disappointed when resources produced by academic teams do not appear to match such standards. This has important implications for the creators of specialist digital resources, since it is clear that to the majority of users, inherent scholarly value is not generally a compensation for a digital resource that is produced to lower standards than those used by commercial organisations.

One of the attractions of information resources is that they are designed for the broadest possible use. There is no real sense of an expert user, and humanities researchers prefer not have their use of an electronic resource constrained or limited. It is therefore vital that more specialist digital resources do not unwittingly limit the way that a resource might be used, since this tends to deter all but expert users.

In terms of content, users require as much information as possible about the quality and provenance of a resource and whether or not it is comprehensive in coverage. Users may find it difficult to comprehend the extent and coverage of digital resources since they lack the clues that are used in the physical world. Scholars can browse a library shelf or several journal issues and quickly determine the approximate extent of the resources available, and thus be sure that they do not miss anything important, but this is much difficult in the case of digital resources. This concern was also found by Bates (1996) when she interviewed scholars using the Getty project resources, and has also been noted by Duff et al (2004) and Dalton and Charnigo (2004) when studying historians. It is clearly therefore a long standing problem which is far from being solved. It is therefore important that producers of electronic resources should make clear the source of their data and their methodology for selecting it and digitising and marking it up, and that this should be easily accessible from the web page of the actual resource as well as with data deposited with the AHDS. The extent of the resource should also be indicated, especially if it is selective or incomplete. An excellent example of this is the *Powys Digital History Project* where this kind of information is available from their website and written in easily understood, non-technical language.

For most users, ease of access is vital: the more hindrances placed in the path of a potential user the more likely it is that they will give up and not access the resource. An interface which makes data more easily manipulable is also very welcome. Users are clearly aware than one of the great assets of digital resources is to enable users to manipulate data in different ways. If this potential is limited, or relies on the use of separate software, scholars may be deterred from using the resource. Thus unless necessitated by copyright regulations, registration screens or similar hindrances to access should be avoided if at all possible. Resources should be designed to help users manipulate data directly from the web interface, to avoid users having to download and use it with separate software.

6.5 Interfaces

If an interface compares badly to the professional interfaces that scholars are accustomed to from commercial products, this immediately creates an adverse impression on potential users. However, at present it appears that the issue of the design of interfaces to digital humanities material is managed in a somewhat random fashion. If a project is lucky enough to benefit from a good designer, the interface may be very good. However, it seems as if many projects do not take this aspect of their work as seriously as the design of the back-end materials themselves. Yet if the interface makes it hard to access such material, a great deal of effort in its creation may be wasted. As one participant at the second workshop remarked: "You don't try and sell someone a car without a steering wheel which is essentially what a lot of these sites are doing, not giving you the things to navigate them" To remedy this situation, project creators must be aware of the importance of good interface design and spend sufficient time on developing and testing interfaces, perhaps bringing in expert advice. This activity must also be costed appropriately in terms of time and funding. Another interesting possibility is to encourage much more collaboration with the AHDS in interface construction. The combination of the subject expertise of project constructors with the technical expertise of the AHDS subject centres, might help to ensure that the resource is sustainable and usable by as wide a variety of users as possible.

6.6 Documentation

Documentation is vital since it preserves the institutional memory of a project. Technology changes with time, and thus solutions developed by an earlier project may become outmoded. However, if new projects can consult the documentation produced by others, they may be able to adapt existing resources or discover solutions to similar problems, and thus could save significant amounts of time and money in the construction of new digital resources. Documentation also enables users to access as much information as possible about the contents of the resource, and the decisions taken in its construction.

Although projects realised that they ought to keep documentation, it was accorded a low priory because it was not a deliverable. Thus only in disciplines where their academic peers would expect documentation as part of a scholarly project did we find it routinely kept. Documentation is of limited use if it is not accessible. It is helpful if users can access documentation through the AHDS archives. However, ideally it should be easily accessible via the same web interface as the digital resource itself. It is also important that it be clearly labelled and easily identified- "About the X project", for example.

Where documentation was kept it tended to be in various types and levels of detail. For it to be most useful there needs to be agreement on the required type and level of documentation. This could be discussed between subject specialists, the AHRC and the AHDS. Once agreed, a template could be produced, that is as standard as possible across all AHRC disciplines, to allow documents from different subjects to be comparable.

6.7 Contact with users

All of the projects made some effort to consider their users. They welcomed feedback about use when provided, and many would have liked more information about the uses to which their resource was being put. Yet the mechanisms used to gather feedback could be improved considerably, and only a minority of the projects interviewed carried out systematic surveys of users, maintained active contact with a user group or made use of their own web logs.

Of the four models discussed above, (Designer as User, Informal User Feedback, 'Contact Us' and Direct User Feedback) the least recommended is the Designer as User. For example, the evaluation of the Teaching and Learning Technology projects in 1999, showed that making assumptions about how a resource will be used, based on the design team's own patterns of use was a risky activity, since it could lead to unexpected difficulties with the use of the resource, or worse, neglect by potential users. (HEFCE, 1999) Successful resources may also attract a larger and more diverse audience then was initially expected. Project directors may fear that if users are consulted, they may require resources of a sophistication that is unachievable, yet the experience of project 19 (discussed above) suggests that had users been consulted fully, the resource would have been less complex, and easier to construct than the team had assumed.

The method of testing early releases of software, or pilot projects on users is preferable. Later versions may then be adapted in accordance with the feedback. However, there are managerial drawbacks to this approach. If user feedback suggests that significant changes ought to be made either to the interface or software, there may not be sufficient time, funding, or even will to make them. Such tests also concentrate on technical aspects of the resource, whereas humanities users seem equally interested in decisions about the contents, its provenance and the selection. These issues are rarely addressed by this method.

If users are surveyed at the beginning of a project, the team are able to gain a more thorough awareness of their needs and preferences. Keeping contact with a group of users, perhaps through an email list, allows projects access to further formative feedback.

Most humanities scholars are not trained in methods of user testing. Yet these skills should be available in most universities, via researchers in Human Computer Interaction, Library and Information Studies, or practitioner librarians. Those proposing to carry out digital projects should be willing to collaborate with such scholars, or buy in outside consultancy or help from the AHDS.

Finally it is evident that funding bodies have a vital role in encouraging contact with user communities. One project carried out user tests as a condition of its grant from NOF. If the AHRC is concerned that resources should be used, it could consider making a similar requirement of funded projects.

6.8 Maintenance and Sustainability

Sustainability presents a problem to which there are no easy solutions given the current models of funding and archiving of digital resources. One solution that has been tried, for example in the JISC NSF funding call of 2002, is to force a university to embed the resource into its own establishment, by guaranteeing money and resources for maintenance of digital resources. However, the funding model for British universities meant that this would have been so costly that it outweighed the initial advantages of grant income and made this scheme unattractive. The present model seems to be that the university will guarantee server space to maintain the web presence of a digital resource, but will seldom provide resources for active updating. Although the latest JISC call (2006) also asks that institutions maintain and update their projects for ten years after the project ends, in remains to be seen how active such updating will be.

Another strategy is being tried by the DIAMM project. The Mellon foundation is granting them additional funding on the condition that they devise a commercial strategy for continued sustainability. This means charging either for all or part of the digital resource which has hitherto been free to users. Attempts to make money out of resources that are initially free, such as online newspapers, suggest that users will pay for digital content only if content is vital and cannot be found elsewhere for nothing. (McCarthy, 2003) Charging may be appropriate in the case of an essential linguistic corpus such as the *Survey of English Usage*. However, the reactions of users at our workshop suggest that this may apply to relatively few resources currently available.

The final option is public funding, for example from the AHRC, for ongoing maintenance. Unlike the present model, where a large amount of funding is given for a limited period, updating would be likely to cost a relatively small amount over a long period. Alternatively the AHDS could be funded to update the resource. For example, all of AHDS Visual Arts' collections are accessible through a common system. Thus updating the system itself should ensure that each collection remains accessible. AHDS Archaeology is paid by some projects to provide interfaces. Thus a similar model of close collaboration between the project staff and AHDS, with appropriate funding, might ensure that the contents of the resource and its interface were updated to make it available in the long term. It might also make it possible to provide feedback to projects on the ongoing use of their resources, something that many of them said they would welcome.

These two options would require an additional funding stream. However, without it the AHRC may have to resign itself to having wasted large amounts of money, since most projects, if not maintained or updated will be trusted less, used less, and ultimately may at best become dysfunctional museum-pieces of the state of digital technology when they were created.

The most promising option seems to be that of collaboration with the AHDS. The single interface of the AHDS Visual Arts collection was welcomed by participants at our workshop, who find it difficult to have continually to learn how to use the variety of interfaces provided by different projects. They were keen to have a common interface to

resources, as they do through the familiar functionality of Windows software. Collaboration between project creators and AHDS would therefore have the potential to ensure not only accessibility to resources now but sustainability of them in future.

6.9 Dissemination

Effective projects work hard to disseminate information about themselves. If digital scholarship is to be accepted as part of the mainstream it is important that presentations should be given at subject specific conferences as well as at those on digital humanities. The AHDS also has an important role to play in the dissemination of information about projects, whether at workshops or through email news letters or its website.

The advocacy of key individuals who are respected equally for their scholarship and digital knowledge may have a galvanising effect on the production of digital resources. If such scholars are seen to have attained recognition and promotion as a result of their digital research activities, the products of such digital research ought themselves to acquire prestige, in an analogous fashion to the respect accorded to books written by distinguished scholars.

It is vital that applicants and reviewers should realise how vital a good dissemination strategy is for the continued use of their project. It may be appropriate for subject panels to give more guidance on this aspect of applicants or perhaps to decide on minimum level of dissemination desirable for digital projects. Certainly the importance of dissemination means that applicants must be expected to include significant amounts of travel funding in their budgets, to allow them to give papers and presentations on their resource at significant numbers of conferences, throughout the life of the project.

7 Recommendations

We have divided our recommendations into two sections. In the first, we create a model of good practice and characteristics that the ideal resource would have, in order to be as well used as possible. The second is a list of issues resulting from our work that the AHRC and other organisations which fund digital humanities research may wish to consider.

7.1 Characteristics that may dispose a resource to be used.

The ideal well-used resource would:

Content:
* Have an unambiguous name that indicates its purpose or content.

* Concern a subject that is either popular in a wide community or essential for a smaller expert one.

* Retain its server logs, and make them available to their funding agency and researchers, subject to confidentiality agreements.

* Keep documentation and make it available from the project web site, making clear the extent, provenance and selection methods of materials for the resource.

Users:
* Have a clear idea of whom the expected users might be; consult them as soon as possible and maintain contact through the project via a dedicated email list or website feedback.

* Carry out formal user surveys and software and interface tests and integrate the results into project design.

* Be designed for a wide variety of users, and include information to help the non-expert to understand the resource and use its contents.

Management:
* Have access to good technical support, ideally from a centre of excellence in digital humanities.

* Recruit staff who have both subject expertise and knowledge of digital humanities techniques, then train them in other specialist techniques as necessary.

* Have access to short term funds to allow it to retain expert staff between projects.

Dissemination:

* Have an attractive, usable interface, from which all material for the project may be accessed without the need to download further data or software.

* Maintain and actively update the interface, content and functionality of the resource, and not simply archive it with the AHDS.

* Disseminate information about itself widely, both within its own subject domain and in digital humanities.

7.2 Recommendations for funding bodies

7.2.1 Recommended duties of projects:

* Log data should be made available to funding bodies and publicly funded research projects, subject to a written agreement with the research centre or project. If necessary there should be the provision for a confidentiality clause, specifying that individuals may not be identified in published research output.

* Projects should seek involvement with the AHDS subject centre throughout the development of the resource, and not simply at the time of grant writing or deposit.

* Applicants to the AHRC should show that they have consulted documentation of other relevant projects and to discuss what they have learnt from it in their case for support.

* Information should be disseminated widely about the reasons for user testing and its benefits, perhaps via AHRC/AHDS workshops. Projects should be encouraged to collaborate with experts on user behaviour.

7.2.2 Funding procedures:

Log data:
*The AHRC might require funded projects and research centres to maintain log data for an agreed minimum period.

*Discussions could be held between all interested bodies, (AHDS, AHRC, JISC etc) to decide upon the form in which logs should be kept, and the minimum retention period for them. (If necessary LAIRAH would be happy to provide further advice on this matter)

Broad vs deep usage:
* When choosing which resources to fund, the AHRC might bear in mind the distinction between resources on popular subjects that are likely to be used by a wide constituency, and those that are essential for a smaller research community. Each type of resource is important, but for a different purpose.

* Experimental research for which there may be no reuse possible could therefore be distinguished from resources for which a use is expected. In the latter case applicants might be asked to provide evidence of the type of use expected, and size of the potential community.

Library and Information resources:
* Information resources, such as libraries, archives and research centres have not been replaced by digital resources. We therefore recommend that digital resources ought not to

be seen as an alternative to libraries and archives: both digital and analogue information resources and services will continue to need funding.

* Librarians are trusted as sources of information about digital resources. They therefore require training in digital resources for the humanities in order to inform scholars about appropriate resources for their research.

Documentation:
*The AHRC might consider making documentation a compulsory deliverable of a funded project.

* Discussions could be held between relevant stakeholders and the AHRC, with the aim of producing an agreed documentation template. This should specify what should be documented, to what level of detail.

Sustainability:
* The issue of sustainability is vital, and further discussions might be held with the AHDS about whether it is possible for subject centres to collaborate with projects, to help to ensure sustainable resources. This would also require further investigation of funding models for long term maintenance and updating.

Users:
* The AHRC might consider requiring evidence of how user contact and feedback will be carried out, as part of the application form. The results of such contact could then be included in the final report as a condition of satisfactory progress.

Training and career development:
* The AHRC might consider requiring universities to offer more training for graduate students and RAs in digital humanities techniques.

* The issue of career progression for former research staff might be considered by the AHRC, and the possibility of short term funding similar to platform grant might be worthy of investigation. Although an initial extra cost, this might avoid repeated funding of similar training for new researchers.

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Appendix A1. Log data

A1.1 An example log file

66.XXX.XXX.XX - - [24/Feb/2005:00:07:12 +0000] "GET /deposit/depintro.htm HTTP/1.1" 200 318 "http://ahds.ac.uk/copyrightfaq.htm"

The above is part of an ASCII file. (66.XXX.XXX.XX) is the IP (Internet protocol) address. (X - a number which has been removed for anonymisation purposes) This is an anonymous machine-to-machine address number used by computers to correctly send and receive data over the internet. (24/Feb/2005:00:07:12 +0000) is a date stamp and records the date and time of the file sent in response to the client's request. (GET /deposit/depintro.htm) records the file sent to the client and the directories where the file is stored on the server. (HTTP/1.1) is the record of the hypertext version communication between server and client. (200) is the status field and states if the request was correct and a file was sent and (318) records the size in bytes of the file sent. (http://ahds.ac.uk/copyrightfaq.htm) is the referrer log and states the address of the last site visited by the client.

A. 1.2 An example listing of pages viewed on the AHDS central site

PAGE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	history	4480	9.8	19.8	19.8
	historical-maps	2016	4.4	8.9	28.7
	projects	1934	4.2	8.6	37.3
	staff	1919	4.2	8.5	45.8
	census-statistics	927	2.0	4.1	49.9
	nineteencentury-census	841	1.8	3.7	53.6
	chcc	838	1.8	3.7	57.3
	chccaccess	475	1.0	2.1	59.4
	special-collections	415	.9	1.8	61.2
	about	410	.9	1.8	63.0
	240305	334	.7	1.5	64.5
	161204	303	.7	1.3	65.9
	hisdan	278	.6	1.2	67.1
	landmarkmaps	256	.6	1.1	68.2
	prosopography	190	.4	.8	69.1
	sect101	186	.4	.8	69.9
	300605	170	.4	.8	70.6
	advisory-committee	166	.4	.7	71.4

	annual2003-04	156	.3	.7	72.1
	hpew	141	.3	.6	72.7
	wishlist	136	.3	.6	73.3
	invitation-to-deposit	129	.3	.6	73.9
	annual1999-2000	123	.3	.5	74.4
	jobs	123	.3	.5	74.9
	how-to-deposit	122	.3	.5	75.5
	recent-releases	122	.3	.5	76.0
	ahrc-advice	118	.3	.5	76.6
	licence	112	.2	.5	77.0
	catalogue-form	111	.2	.5	77.5
	pollbooks	111	.2	.5	78.0
	diary	108	.2	.5	78.5
	depositing-team	104	.2	.5	79.0
	documentation-guidance	103	.2	.5	79.4
	annual2001-02	101	.2	.4	79.9
	transfer	101	.2	.4	80.3
	wilfred	101	.2	.4	80.8
	recent-acquisitions	100	.2	.4	81.2
	annual2002-03	98	.2	.4	81.6
	guides	98	.2	.4	82.1
	sitemap	98	.2	.4	82.5
	news	97	.2	.4	82.9
	deposit-formats	93	.2	.4	83.3
	oral-history	93	.2	.4	83.8
	annual2000-01	90	.2	.4	84.2
	community-histories	89	.2	.4	84.5
	collections	87	.2	.4	84.9
	annual1998-99	86	.2	.4	85.3
	annual1997-98	85	.2	.4	85.7
	annual1996-97	75	.2	.3	86.0
	copyright-introduction	72	.2	.3	86.3
	creating	70	.2	.3	86.6
	ahrb-advice	68	.1	.3	86.9
	deposit	66	.1	.3	87.2
	sect71	63	.1	.3	87.5
	waiver-of-deposit	61	.1	.3	87.8
	wages	60	.1	.3	88.1
	waiver-of-deposit-form	60	.1	.3	88.3
	data-transfer	59	.1	.3	88.6
	depositing	58	.1	.3	88.8
	genealogy	58	.1	.3	89.1
	gis_course_details	58	.1	.3	89.3
	project-management	57	.1	.3	89.6
	exec-strategy-05to07	56	.1	.2	89.8
	writing-appendix	55	.1	.2	90.1
	team	53	.1	.2	90.3
	information-papers	49	.1	.2	90.5
	suffrage	48	.1	.2	90.8

	gloucester	47	.1	.2	91.0
	metadata	47	.1	.2	91.2
	newsletters	46	.1	.2	91.4
	search	46	.1	.2	91.6
	coel	45	.1	.2	91.8
	imperial	44	.1	.2	92.0
	stone	44	.1	.2	92.2
	canterbury	42	.1	.2	92.4
	evaluation	41	.1	.2	92.5
	publications	41	.1	.2	92.7
	reports-and-policies	41	.1	.2	92.9
	case-studies	40	.1	.2	93.1
	corpus	39	.1	.2	93.2
	mail%20to_%20katherine.keats-rohan_histo	38	.1	.2	93.4
	gis_course_details_and_booking_form	37	.1	.2	93.6
	events	36	.1	.2	93.7
	exeter	36	.1	.2	93.9
	newham	36	.1	.2	94.1
	correspondence	35	.1	.2	94.2
	theology	35	.1	.2	94.4
	grosseteste	34	.1	.2	94.5
	lampeter	34	.1	.2	94.7
	resourcingviii	34	.1	.2	94.8
	sect72	34	.1	.2	95.0
	forms	33	.1	.1	95.1
	patronage	33	.1	.1	95.3
	ahrb	32	.1	.1	95.4
	creating-introduction	30	.1	.1	95.5
	sect102	30	.1	.1	95.7
	britain	29	.1	.1	95.8
	o512w	28	.1	.1	95.9
	documentation	27	.1	.1	96.0
	o514w	27	.1	.1	96.2
	sect34	27	.1	.1	96.3
	ahrc	25	.1	.1	96.4
	diamm	25	.1	.1	96.5
	survey	25	.1	.1	96.6
	hpeworderform	24	.1	.1	96.7
	o515w	24	.1	.1	96.8
	sect11	24	.1	.1	96.9
	sect22	24	.1	.1	97.0
	sect12	23	.1	.1	97.1
	sect32	21	.0	.1	97.2
	sect42	21	.0	.1	97.3
	sect33	20	.0	.1	97.4
	ahds-feasibility-study	19	.0	.1	97.5
	sect35	19	.0	.1	97.6
	sect51	19	.0	.1	97.7

sect13	18	.0	.1	97.7
sect21	18	.0	.1	97.8
sect23	17	.0	.1	97.9
sect24	17	.0	.1	98.0
sect43	17	.0	.1	98.0
durationprofile	16	.0	.1	98.1
sect31	16	.0	.1	98.2
why-bother-digitising	16	.0	.1	98.3
sect73	15	.0	.1	98.3
sect41	14	.0	.1	98.4
sect26	13	.0	.1	98.4
sect27	13	.0	.1	98.5
sect46	13	.0	.1	98.6
summary	13	.0	.1	98.6
sect25	12	.0	.1	98.7
sect61	12	.0	.1	98.7
essex	11	.0	.0	98.8
sect64	11	.0	.0	98.8
sect74	11	.0	.0	98.9
gis	10	.0	.0	98.9
sect52	10	.0	.0	99.0
sect62	10	.0	.0	99.0
sect63	10	.0	.0	99.0
sect83	10	.0	.0	99.1
acknow	9	.0	.0	99.1
sect14	8	.0	.0	99.2
sect15	8	.0	.0	99.2
sect16	7	.0	.0	99.2
sect28	7	.0	.0	99.3
sect38	7	.0	.0	99.3
sect47	7	.0	.0	99.3
sect54	7	.0	.0	99.4
sect81	7	.0	.0	99.4
sect82	7	.0	.0	99.4
sect94	7	.0	.0	99.4
sect39	6	.0	.0	99.5
sect44	6	.0	.0	99.5
sect48	6	.0	.0	99.5
sect75	6	.0	.0	99.6
sect84	6	.0	.0	99.6
sect92	6	.0	.0	99.6
sect95	6	.0	.0	99.6
sect310	5	.0	.0	99.7
sect36	5	.0	.0	99.7
sect37	5	.0	.0	99.7
sect45	5	.0	.0	99.7
sect53	5	.0	.0	99.7
sect55	5	.0	.0	99.8
sect65	5	.0	.0	99.8
sect66	5	.0	.0	99.8

	sect67	5	.0	.0	99.8
	sect68	5	.0	.0	99.9
	sect91	5	.0	.0	99.9
	sect93	5	.0	.0	99.9
	o513w	4	.0	.0	99.9
	Svensson	3	.0	.0	99.9
	#advice-team	2	.0	.0	99.9
	#top	2	.0	.0	99.9
	digitising-history	2	.0	.0	100.0
	40	1	.0	.0	100.0
	#	1	.0	.0	100.0
	#accessing	1	.0	.0	100.0
	#creators	1	.0	.0	100.0
	#history	1	.0	.0	100.0
	#literature	1	.0	.0	100.0
	annual	1	.0	.0	100.0
	applicants	1	.0	.0	100.0
	census_information	1	.0	.0	100.0
	essex%5Funi%5Flogo%2Egif	1	.0	.0	100.0
	Total	22610	49.4	100.0	
Missing	index	23070	50.4		
	index-2	89	.2		
	index-3	37	.1		
	Total	23196	50.6		
Total		45806	100.0		

Appendix A2: Neglected Resources workshops

A 2.1. Recruitment of participants

A group of 20 participants was recruited to represent a cross section of humanities scholarship. Most had indicated interest in undertaking further research on questionnaires for various ICT strategy projects, or were these scholars' students or colleagues. Representatives of the AHDS subject centres and other digital humanities professionals were also invited. We wanted participants to be reasonably comfortable with the use of digital resources, to help ensure that a negative reaction to a project was not caused by a lack of confidence in using online resources.

The second workshop participants were MA students in Librarianship, Archives and Electronic Publishing. This group has received extensive training in the use and evaluation of digital resources in the humanities, and we thus wished to see whether this would affect their reactions to the sample projects.

A 2.2 Conduct of the workshop

Each participant had between five and ten minutes to investigate the resource and note their views of it. Recent research indicates that users make up their mind about whether they will use web-based resources in a remarkably short time (Lindgaard et al. 2005). Nicholas et al (forthcoming) have also discovered that most visitors bounce out of websites very quickly after entering them. Thus we wanted participants to make judgements relatively quickly, as they might if they discovered a resource for the first time, from a web search, library page or subject portal. Participants noted their reactions on a pro-forma (see appendix 3) which then informed plenary discussion of the resources.

A 2.3 Problems with acquiring workshop data.

Recruiting participants for the first workshop proved difficult. We contacted people who were either known to the research group as users of digital resources, or those who had replied to surveys indicating an interest in further research. While digital humanities professionals were eager to take part, university lecturers were harder to recruit. We initially tried to recruit a mixture of humanities computing professionals and traditional academics, and to keep a balance between subject specialists. However, this proved impossible. Many of the academics did not reply to our (repeated) email invitations, and in a notable case reacted with hostility and a demand for payment. We therefore accepted all those who were interested enough to volunteer. This meant a potential lack of subject balance, with a population skewed towards historians and archaeologists, graduate students and humanities computing professionals.

This problem may have been caused by a simple lack of time on the part of busy academics. However, it may also be evidence of a lack of interest, or perhaps confidence,

in the use of digital resources amongst the mainstream academic profession. Had the subject matter been of genuine interest it is likely that more academics would have been keen to participate. There was also a marked contrast with the response from those whom we interviewed about their research projects, who in most cases replied swiftly and made time to talk to our researchers. The latter were to some extent digital enthusiasts, since they had directed the development of a digital research project. This supports the impression of a divide between the enthusiastically digital (who appear to be a minority) and the majority of the academic profession. This is worrying, since there is a danger that digital humanities may therefore become ghettoised rather than further integrated into scholarship.

A 2.3.1. Lack of confidence

Many participants, especially those from a more traditional humanities background showed a marked reluctance to commit themselves as to the quality and usefulness of resources, especially in areas in which they were not subject specialists. Although we made it clear that all findings would be anonymised and that we particularly wanted to know their views about whether and why a resource was used, some still preferred to say they did not know, or not to provide further comments. This suggests a lack of confidence in expressing views about digital resources; especially in areas where participants were not specialist, or resources they had not so far encountered. One participant even argued that it was wrong of us to offer opinions or judge the work of others in this way. Yet it is likely that s/he will do so when reviewing a book in a scholarly journal, examining a PhD or refereeing articles for publication. However, these activities are a familiar part of the analogue scholarly world and it appears that digital resources are still too remote from the experience of the majority of humanities academics for them to feel confident in their opinions of them.

This may be explicable by reference to the Wundt Curve, which is a concept from psychology which seeks to model the relationship between familiarity and pleasure. (Saunders and Gero, 2004). This theory argues when something is very unfamiliar we tend to dislike it because of the cognitive effort necessary to comprehend the concept or enjoy something like an unusual art work or musical composition. However, if we are too familiar with something we do not enjoy it because there is too little cognitive effort involved, and thus the concept or object becomes banal. Ideally there should be enough cognitive difficulty to stimulate the brain without overstretch or boredom. It is arguable therefore that for most humanities academics, specialist digital humanities research resources are too unfamiliar, and thus this causes them to feel uncomfortable and unwilling either to use them or to express opinions about them. Whereas informational material, journals and subjects centres, even if accessed by a web page, are sufficiently familiar that they are more easily comprehensible, and place the user at a more optimal point on the curve. To test this hypothesis we ran the workshop again with a group of MA students from UCL SLAIS, all of whom are familiar with digital humanities resources. We will report in the findings in detail elsewhere, but they were more confident in offering opinions of the resources, as compared with the first group.

Appendix A 3. Data gathering instruments:

A. 3.1 Workshop feedback sheets

Name of participant:

Title of project:

Please explore this resource briefly (this should take 5-10 minutes), then make a note of your views on this sheet. Your views will inform the discussion this afternoon.

1. Have you heard of this resource before today? If so, how do you know of it?

2. Have you ever used this resource for teaching or research? (please tick all that apply)

For research [ ]
For both teaching and research [ ]
I use it often [ ]
I use it rarely [ ]
I have never used it [ ]

3. What is your opinion of the quality of this resource? (Please tick one)

Very good [ ]
Good [ ]
Average [ ]
Poor [ ]
Unacceptable [ ]

a. What factors led you to this rating?

4. Would this resource be useful to you in your teaching or research? (Please tick one)

Very useful [ ]

Quite useful [ ]
Not at all useful [ ]

5. If you would not use it, please tell us which factors influenced your decision

The resource is too difficult to navigate [ ]
The content is too elementary to be useful [ ]
The content is too limited in scope [ ]
The resource is designed for teaching not research [ ]
I could not find the material I need [ ]
The content is not sufficiently specialised [ ]
The content is too specialised [ ]
The design of the resource is unattractive [ ]
The resource is too difficult to use [ ]
It took me too long to find useful material [ ]
This kind of resource has no bearing on my research or teaching [ ]
Another reason (please state)

6. Would you recommend the resource to - Undergraduate students? [ ]
Graduate students? [ ]
Your colleagues? [ ]

7. How popular do you think this resource is in the wider academic community?

It is well used [ ]
It is neglected [ ]

What leads you to this conclusion?

Any other comments about the design or usefulness of the resource.

A 3.2 Interview guide:

A. Creation and maintenance:

- What is the history of the resource?
- Why was it created?
- Whose idea was it?
- Who funded the resource?
- How long did it take to create? Is it still being developed?
- If not, is it still being maintained or updated- if so by whom?

B Technical Aspects:

- What technical standards did you use? (XML, image quality, metadata etc)
- How did you find out about them?
- What help and support did you have- locally and nationally?
- How useful was this?

E. Documentation:

- Did you document your decisions or comment your code? If not, why not?

C. Users:

- Did you have any contact with potential users?
- If yes, what form did this take?
- At what point in the project did this happen?
- Did this have any effect on the design of the resource or decisions taken about it?
- Do you still have contact with a user group?

D. Post production:

- Has the resource turned out as you expected or hoped?
- If not what is different?
- Are you planning any other Digital Humanities projects?
- Has this inspired other members of the department to undertake digital research?
- What lessons have you learned from it?
- Would you do things differently in future as a result of this experience?
- If you were to go to another university or organisation what would happen to the project?

E. Dissemination:

- Are you aware of how popular the resource is?
- How did you publicise the resource?
- Is the publicity ongoing?

Appendix A 4. Report on staffing issues.

Many of the PIs that we interviewed perceived the employment of excellent staff as key to the success of their project. They stressed how rare and valuable such staff were, since they had a combination of research in a humanities discipline, and technical expertise, sometimes of a very high level.

> She is a very special breed of person because she is herself a [subject specified] scholar, among other things and an IT person and you know I think that's where the future lies. Not to the exclusion of other practitioners doing other things but you know you need new breed and people like that. (P22)

As shown above also had to be able to learn new digital techniques and to liaise with computer support staff, thus excellent communication skills were essential.

> [the RA] actually built the database in Access and she consulted with the IT people at the university, IT team, and she has also been in touch with the AHRC data team and so she […] comes out with all these specialists about how to go about it but she actually learnt to use Access from scratch and build it all herself and so she has kind of been responsible for the technological side. (P21)

PIs stressed that it was vital that technical staff should be able to understand the requirements of a humanities project, since if this level of understanding was not present then serious difficulties could result.

> I did try having the website designed internally by our own computer science department and it was a total disaster. The [features of resource] are all circular in shape, when they had finished processing the images they were all oval, as if they had been sat on by an elephant and I said "But the image is oval." And they said, I quote them exactly "Oh it won't matter people won't know". (P14)

A 4.1 Training

As a result RAs had tended to be employed for their subject expertise, and then required training.

> The technical person also spent an enormous amount of time researching the possibilities and training themselves and that was actually one of the drawbacks, to be honest, with the project in a sense that he had to spend basically a year training himself. When we advertised the post we had a couple of technical people who had done database work and things like that but they hadn't done audio and video and they didn't know anything about [the subject] and this person had been a [practitioner] and had worked at the department and you know I knew very well and he had done some work on computers but not a lot and so, but he had done loads of videoing of performances. So I actually thought it would be better to go with him than somebody who knew more about computers because he would be sympathetic to the project and understand what the aims were but it did take him a long time to, yes to actually train himself. (P17)

This PI also commented that as a result she advises those bidding for funding to cost in plenty of time for RA training.

Both PIs and RAs, however, commented on the often unsatisfactory nature of training available. Many had been forced to teach themselves new techniques sometimes in the absence of any other training.

> There was no provision within the grant […] to provide me with anymore advanced training to do what I should be doing.
> I had had database training but not at that sort of level […] I have people come to me and it's like well you know they won't pay for us to learn how to do this because we ought to know how to do it. […] I have done a MSc in Computing and Archaeology […] I can program […] but I have never done any Windows programming before, […] so I was having to teach myself the Windows system on a live dataset, […] that people were trying to use and that did sort of create problems. (P19, RA interviewee)

As shown above, absence of technical knowledge on the part of some PIs meant that RAs might be expected to undertake tasks for which they had insufficient knowledge, or were not given enough time to train themselves in new techniques or to keep up with technical developments.

A 4.2 Career progression

PIs also expressed concern about career progression for RAs, and many were unhappy that expert researchers were often lost after the end of funding periods.

> [It is] very hard to find good assistants. I mean one of the bottlenecks in this kind of work is that it takes a certain odd combination of skills in order to be able to do it well, so you need to be very detail oriented, you need to know [the subject] and have a analytical certain mind and you have to be computationally literate. […] I mean we have tried to get other people to do this kind of work [but] it's difficult to find people with the right combination of skills and get the money to pay them […] because the money comes and goes. I have been lucky because I have been doing this for a long time so I have developed all the appropriate skills [but] I am dependant on funding and funding or I have to go and do something else. […] what you really need is a secure funding scheme so people can actually develop these kind of skills. But you can't just like take them off the street. (P1, RA interviewee)

Given the relative scarcity of funding in the arts and humanities and the long lead-times for applications, it was likely that experienced researchers might be forced leave to find other work. Thus if subsequent funding were granted, PIs were obliged to train a new researcher from scratch. One of the very few exceptions to this was in Sheffield, where the French department had such a critical mass of projects that an RA was able to move from one completed project to a new one, and finally became a university lecturer on the strength both of her subject and digital experience and publications. As the PI commented:

> It's a whole new career structure that doesn't really exist in the humanities. How do research associates build on what they have done to a proper career? And recently [the RA] has had her post confirmed so she really is a fully fledged lecturer. So that's a happy ending and a sort of collaboration really of the potential for developing a whole

> set of innovative research schemes in a non-conventional career path which leads it into a conventional one: because you couldn't of course bring someone in with expertise which is just, well like gold dust really, very rare. (P22)

A 4.3 Career progression for PIs

Related to these issues is that of recognition for those scholars who engage in digital humanities research. One PI, a relatively junior scholar, who has become well known due to her digital humanities research, also raised these concerns:

> This is one of my difficulties because my academic profile is quite different from my colleagues and in fact it actually does map onto a science model much more. I publish in journals, I haven't got a monograph because […] the minute I start typing its out of date and I go to a lot of conferences
> [several intervening paragraphs]
> I think I am doing an interesting job and productive work but I think we have to rethink some of those expectations if we want other people to join us […] Invariably I work with people who are full professors and men, I am usually the only woman and the only person under 50 in the room and that's a weird thing for me and I do think that its one of the reasons I persist but it does put me in a very difficult position in terms of the responsibility I am given versus the experience I have and the, you know academic cloak that I have because I don't have the kind of, sort of years and years of scholarship behind me to make the kind of claims that I am making in some policy level things and yet on one else is in a position to make any decisions at all. So I find I alternate between thinking its terribly exciting being at forefront and being pushed out in front and thinking wait a minute, can't I just do a normal job you know teach and write books like everybody else. So I would actually warn a little bit against, you know I am part of the new group of people but I think its quite difficult to advise even you know PhD students who want to work in this area that they may not get promoted, they may not get jobs you know so I think its something that needs to be taken on board. I don't know by whom or under what circumstances but crediting this work properly is really important. (P17)

The research culture of particular disciplines affects the production and use of digital resources. As the PI makes clear, digital scholarship tends to assume a more scientific model of scholarly production. In archaeology this is recognised and rewarded, and the production of a good digital resource is regarded as similarly prestigious as important print publications. The *Ave Valley* project, for example, was submitted successfully to RAE 2001. However, this is not the case in all humanities disciplines.

A 4.4 Conclusion: staff, training and progression

To address the shortage of skilled staff it would be advisable for more training to be provided. Even if RAs have some technical knowledge, they may also need ongoing training in techniques particular to their project. However, the time and expense would be greatly lessened if more training were provided to graduate students in the techniques needed for digital humanities research. More could be done by universities themselves to provide training for research students in digital technologies which would provide important transferable skills whether or not they continue to a career in academia.

Career progression is also an important issue. It is frustrating for all, and a waste of time and money spent on training, if the RA must then be made redundant at then end of a funding period and a new employee trained if other funds are found. A fortunate few have a sufficiently large number of projects to enable RAs to more to different projects, and perhaps become a permanent academic member of staff, as seen at Sheffield. However this kind of critical mass is very rare. One way to address this problem of such a loss of experienced RAs might be by adopting something similar to the Platform Grant Scheme offered by science funding councils such as the EPSRC. This allows short term funding to be granted so that experienced staff can be kept in employment while further funding is sought. Although such a scheme would be costly, the present situation means that the AHRC may be paying repeatedly for staff training which might be avoided were platform funding available.

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[1] http://www.ahrc.ac.uk/

[2] http://www.jisc.ac.uk/

[3] http://www.curl.ac.uk/

[4] http://www.ucl.ac.uk/ciber/ciber.php

[5] http://ahds.ac.uk/

[6] http://www.humbul.ac.uk/

[7] http://www.artifact.ac.uk/

[8] The RePAH project (http://repah.dmu.ac.uk/) is another of the ICT Strategy Projects, which examiner user requirements for subject portals. They used the same three portals, and thus we undertook the analysis of the log data on their behalf.

[9] http://www.ahds.ac.uk/catalogue/collection.htm?uri=hist-4635-1

[10] http://www.ota.ox.ac.uk/ text 2216

[11] http://www.ahds.ac.uk/catalogue/collection.htm?uri=hist-3441-1

[12] http://www.ahds.ac.uk/catalogue/collection.htm?uri=va-ECKC-1

[13] http://www.ahds.ac.uk/catalogue/collection.htm?uri=va-OEP-1

[14] http://www.ahds.ac.uk/catalogue/collection.htm?uri=hist-4828-1

[15] http://www.ahds.ac.uk/catalogue/collection.htm?uri=va-IWM-1

[16] http://www.ahds.ac.uk/catalogue/collection.htm?uri=lll-2462-1

[17] http://www.ahds.ac.uk/catalogue/collection.htm?uri=arch-335-1

[18] http://www.ahds.ac.uk/catalogue/collection.htm?uri=pa-1018-1

[19] http://www.ucl.ac.uk/history/englishmonasticarchives/

[20] http://www.oldbaileyonline.org/

[21] http://www.shef.ac.uk/hri/projects/projectpages/gide.html

[22] http://www.shef.ac.uk/hri/projects/projectpages/frenchstars.html

[23] http://www.ucl.ac.uk/english-usage/

[24] http://vads.ahds.ac.uk/collections/LCFCA.html

[25] http://ads.ahds.ac.uk/catalogue/projArch/eynsham_OAU/index.cfm?CFID=370757&CFTOKEN=91009870

[26] http://ads.ahds.ac.uk/catalogue/search/fr.cfm?rcn=AVE_MILLET_BA-1

[27] http://www.arts.ed.ac.uk/europgstudies/rprojects/avant-garde/index.html

[28] http://www.diamm.ac.uk/

[29] http://vads.ahds.ac.uk//collections/FSB.html

[30] http://www.ucl.ac.uk/Bentham-Project/

[31] http://www.bris.ac.uk/parip/

[32] http://history.powys.org.uk/

[33] http://www.ucl.ac.uk/archaeology/cisp/

[34] http://ahds.ac.uk/performingarts/index.htm

[35] http://ahds.ac.uk/visualarts/index.htm

[36] http://www.ahds.ac.uk/catalogue/collection.htm?uri=va-LCFCA-1

[37] http://www.commonwealth.org.uk/

[38] http://www.assemblage.group.shef.ac.uk/

[39] These were, *CAPRA*- an archaeology journal, *The Centre for the Study of the English Cultural Tradition*, *The Association for Low Country Studies*, *The International Band Dessinée Society* and the *Hegel Society of Great Britain*. Three of the most popular resources at Edinburgh (29% altogether) were the *Centre for the History of the Book* (second) the *Dictionary of the Older Scots Tongue* – (fifth) and the *Edinburgh Journal of Gadda Studies*. (The last two sites do not give access to the resource, but information about it).

[40] http://www.bl.uk/

[41] http://www.nationalarchives.gov.uk/

[42] http://www.jstor.org/

[43] http://lion.chadwyck.com/marketing/index.jsp

[44] http://www.lancs.ac.uk/palatine/

[45] http://vos.ucsb.edu/

[46] http://www.perseus.tufts.edu/

[47] http://ahds.ac.uk/history/index.htm

[48] http://www.kcl.ac.uk/schools/humanities/cch/

[49] http://www.shef.ac.uk/hri/

[50] http://heds.herts.ac.uk/

[51] http://www.ilrt.bris.ac.uk/jidi/

[52] http://www.nof.org.uk/

[53] http://www.history.ac.uk/